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tive opinion, as further experiments are wanting to furnish sufficient grounds for a decision.

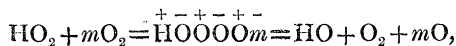
3. "On the Condition of certain Elements at the moment of Chemical Change." By B. C. Brodie, Esq., F.R.S.

This paper contains an experimental inquiry, founded upon certain theoretical considerations as to the condition of bodies at the moment of chemical change, with the discussion of which the introduction is occupied.

The author considers that the peculiar combining properties of the elemental particles of which chemical substances are composed, are due to a chemical polarity of the acting masses, which takes place at the contact of the bodies, and have only a remote relation to the electro-chemical nature of the isolated element. In support of this view are cited the phænomena of double decomposition, and the properties of the so-called "nascent" elements, which could never be inferred from the nature of the element when once isolated and formed. Double decomposition the author considers to be the true type of all chemical action. In the case of the bodies called compound, this polarity is manifested by the division of the substance into two parts, which are universally considered to stand to one another in a certain positive and negative relation; and also by the synthesis, which corresponds to this division.

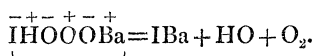
The object of the paper is to point out that an analogous polar relation exists, at the moment of chemical change, between the particles of which the elemental bodies themselves are composed, of which condition we have evidence both when the isolated element is chemically acted on by other bodies, and also in certain cases of the formation of the element from its compounds, in which we have a division and synthesis of the element corresponding (so far as this polar relation is considered) to the division and synthesis of a compound body. The evidence of these statements is, that when the isolated element is chemically acted upon, we may observe in it (as manifested by its combining properties) the same polar or nascent state as is developed in compound bodies; and also that we have certain remarkable cases of the synthesis of the element, to account for which we must assume the same combining relation between its particles as between the particles of which a compound substance is formed. These statements are supported by numerous instances.

The experimental inquiry relates to a remarkable case of the formation of oxygen, in which the author considers that the mutual attraction of the particles of that element determines the decomposition of the substances from which it is evolved. The experiment in question is the mutual decomposition which the peroxide of hydrogen and certain metallic oxides, first discovered by Thénard, undergo when in contact. Thus the author regards, in this case, the decomposition of the metallic oxide as a phænomenon which may be represented thus:—



the metallic peroxide being reduced by the polar particle of oxygen, as in other cases it might be by hydrogen itself. The proof that such a chemical relation really exists between the particles of oxygen, would be found in the proportion in which the two substances were reduced. The paper contains an elaborate inquiry on this point in the case of the chloride and of the oxide of silver; the general result of which is, that these substances are capable of being reduced in various but definite proportions, according as the conditions of temperature and mass are varied. All the terms of this series of ratios have not been determined; but it is ascertained that the relative loss for the two substances proceeds by intermittent steps, and that the whole action is confined between the limits of the ratio of equality on the one hand, and the purely catalytic action (in which the metallic oxide would suffer no reduction) on the other; neither of which limits is ever absolutely reached.

The constant loss of oxygen from the decomposing bodies in equal equivalent proportions is found in the reaction of the peroxide of barium with iodine in the presence of water. In this experiment, the water in the presence of the iodine is reduced just as the peroxide in the other experiments; but here the loss is constant, and the change may be represented thus:—



In this experiment no oxide of iodine whatever is formed, and the author considers that the formation of the oxygen itself is here the corresponding fact to the formation of the iodous acid, which takes place when iodine acts upon baryta.

4. "The Calling of the Sea." By Richard Edmonds, Jun. Communicated by W. J. Henwood, Esq., F.R.S.

In this communication the author states, that in the neighbourhood of Penzance there is often heard inland a murmuring or a roaring noise, locally termed "the calling of the sea," which on some occasions extends to the distance of eight or ten miles; whereas, at other times, although to a person on the shore the sea may be equally loud, and the state of the weather may appear equally favourable, no sound from the sea can be heard at the tenth part of that distance. From his observations during six years, he concludes, that when the calling of the sea proceeds from a direction different from the wind, or when it occurs during a calm, it is usually followed within six hours by a wind from the quarter from which it is heard.

5. "On the Structure of the Membrana Tympani in the Human Ear." By Joseph Toynbee, F.R.S. &c. &c.

In this paper the membrana tympani is described as consisting of the following layers, which are quite distinct from each other, both as regards their structure and functions:—